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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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EXAMINER

THOMPSON, JR, OTIS L

ART UNIT	PAPER NUMBER
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2619

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06/11/2008

PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/755,464	Applicant(s) PEETERS ET AL.	
	Examiner OTIS L. THOMPSON, JR	Art Unit 2619	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 05 March 2008.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1,2,4-7,13-16 and 19-29 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1,2,6,7 and 13-16 is/are rejected.
- 7) ☒ Claim(s) 4,5 and 19-29 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

Response to Arguments

1. Applicant's arguments with respect to claims 1, 2, 4-7, 13 have been considered but are moot in view of the new ground(s) of rejection.
2. Applicant's arguments, filed March 5, 2008, with respect to the rejection(s) of claim(s) 14-16 under 35 U.S.C 103(a) have been fully considered and are persuasive. Therefore, the rejection has been withdrawn. However, upon further consideration, a new ground(s) of rejection is made in view of the prior art outlined in the detailed action.

DETAILED ACTION

Claim Objections

3. Claims 1, 19, and 26 are objected to because of the following informalities: the claims have indefinite subject matter in the preambles. Examiner suggests either the removal of the phrase "can be" or the changing of the phrase "can be" to "is". Claims 2, 4-7, and 13, which depend from claim 1, claims 20-25, which depend from claim 19, and claims 27-29, which depend from claim 26, are thus objected. Appropriate correction is required.

Claim Rejections - 35 USC § 102

4. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the

applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

5. Claims 1, 2, and 13 is rejected under 35 U.S.C. 102(e) as being anticipated by Carlson (US 6,907,062 B1).

6. **Regarding claim 1**, Carlson discloses *a transmitter for an asymmetric digital subscriber line (ADSL) modem* (Column 2 lines 48-52, see "...communication nodes are ADSL modems...") *that can be coupled to a receiver over a local loop* (Figure 1 label 105, Tx coupled to Figure 1 label 114, Rx) *comprising:*

a. *A pseudo-random bit sequence generator that outputs an output pseudo-random signal based on the output PRBS* (Column 3 lines 52-60, see "...PRBS generators employed in ADSL modems...PRBS generator generates repeated bit patterns that repeat every 511 bits in the downstream direction...");

b. *A Medley signal generator that receives the output PRBS and generates a Medley signal based on the output PRBS* (Column 3 lines 17-21, see "...PRBS MEDLEY generator for use in ADSL modems...", i.e. Medley signal is inherently generated based on the output PRBS);

c. *Wherein said pseudo-random bit sequence generator operates in a parameter selection mode* (Column 3 lines 28-33, see "...initial state of the shift register...specifying one of 2^N-1 possible non-zero initial states, one of 2^N-1 possible PRBS sequences can be selected for a given PRBS generator..."; Column 5 lines 57-63, see "...shift register based PRBS generator...based on a primitive polynomial $1+x^{-18}+x^{-23}$...") *and includes a controller coupled to a bit*

sequence module (Not shown or specifically disclosed but is inherent), said controller passing selected parameter data to said bit sequence module (Not shown or specifically disclosed but is inherent), and said selected parameter data including at least one of a selected initial state (Column 3 lines 28-33, see "...initial state of the shift register...specifying one of 2^N-1 possible non-zero initial states, one of 2^N-1 possible PRBS sequences can be selected for a given PRBS generator...") and selected polynomial that defines the processing of bits in said bit sequence module (Column 5 lines 57-63, see "...shift register based PRBS generator...based on a primitive polynomial $1+x^{-18}+x^{-23}$...") to generate the output pseudo-random bit sequence.

7. **Regarding claim 2**, Carlson discloses that *the ADSL modem includes multiple channels* (Figure 6 step 601, Determine Number of Carriers, i.e. number of carriers implies multiple channels), *and said Medley signal generator includes a Medley tone encoder that modulates 4QAM symbols based on the received output PRBS to generate a set of tones for the multiple channels* (Column 3 lines 52-56, see "...ADSL modems conform to the incorporated ITU-T Recommendations G.992.1 and G.992.2...", i.e. 4QAM modulation is included in these recommendations).

8. **Regarding claim 13**, Carlson discloses that *said transmitter transmits selected parameter data to the receiver* (Figure 2 step 203 and Figure 6 step 609, Inform Remote Modem Of The Selection).

Claim Rejections - 35 USC § 103

9. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

10. Claim 6 is rejected under 35 U.S.C. 103(a) as being unpatentable over Carlson (US 6,907,062 B2) in view of Antoine (US 2001/0036274 A1).

11. Carlson does not specifically disclose that *said controller selects said selected parameter data based on an association with a reasonable peak-to-average (PAR) ratio for a sequence of Medley symbols*. However, Antoine discloses a method to generate a pseudo-random sequence of multi-carrier data symbols in which the peak to average ratio (PAR) is not compromised in pursuit of producing a highly random sequence of bits (Paragraph 0007, see "...if L [number of bits in the repetitively generated pseudo-random data sequence of bits] however is chosen high, the scrambler is not optimized in terms of PAR...solution is not preferred in multi-carrier transmission systems wherein PAR reduction is a major concern..."). Hence, the advantage of the method of Antoine is a reduction in the PAR ratio.

Therefore, it would have been obvious to one of ordinary skill in the art at the time the applicant's invention was made to incorporate the teachings of Antoine into Carlson in order to reduce the PAR ratio.

12. Claim 7 is rejected under 35 U.S.C. 103(a) as being unpatentable over Carlson (US 6,907,062 B2) in view of Carlson (US 2003/0012272 A1), hereinafter referred to as Carlson_2.

13. Carlson does not specifically disclose *a memory that stores a table that includes data in associated fields, said fields including Maximum PAR ratio for a sequence of Medley symbols, initial state, and transmit signal parameters*. However, Carlson_2 discloses a method in which the selection of a signal is based on the computed PAR ratio of that signal (See Abstract). Although this signal is a Q-mode (non data mode) signal (See Paragraph 0010), an obvious modification to this would be to select the signal based on the computed PAR ratio when the signal is not a Q-mode signal. The PAR ratio would then be computed as it relates to certain signal characteristics.

Carlson_2 further discloses that the calculated PAR and the corresponding initial state of a PRBS generator are stored in a table (Paragraph 0038) to be later selected from memory (Paragraph 0045). It would have been obvious to include *transmit signal parameters* in the table in memory in view of the modification of computing the PAR ratio based on a signal that is not in Q-mode. While Carlson_2 allows for the selection of lowest PAR output by the transmitter (Paragraph 0010), in view of the aforementioned modifications, Carlson_2 would obviously allow for the selection of the best PAR output by the transmitter.

Therefore, it would have been obvious to one of ordinary skill in the art at the time the applicant's invention was made to incorporate the teachings of aforementioned

modified teachings of Carlson_2 into Carlson in order to allow for the selection of the best PAR output by a transmitter.

Claim Rejections - 35 USC § 103

14. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

15. Claims 14-16 are rejected under 35 U.S.C. 103(a) as being unpatentable over Antoine (US 2001/0036274 A1) in view of Carlson (US 6,907,062 B2).

16. **Regarding claim 14**, Antoine discloses *selecting parameter data based on an association of the selected parameter data with a reasonable peak-to-average ratio*. Specifically, Antoine discloses a method to generate a pseudo-random sequence of multi-carrier data symbols in which the peak to average ratio (PAR) is not compromised in pursuit of producing a highly random sequence of bits (Paragraph 0007, see "...if L [number of bits in the repetitively generated pseudo-random data sequence of bits] however is chosen high, the scrambler is not optimized in terms of PAR...solution is not preferred in multi-carrier transmission systems wherein PAR reduction is a major concern...").

Antoine does not specifically disclose that the selection of parameter data is *for a sequence of Medley symbols according to at least one transmit signal parameter of an ADSL modem and generating a pseudo-random bit sequence based on the selected*

parameter data, whereby the pseudo-random bit sequence can be output to seed generation of a Medley signal in the ADSL modem.

However, Carlson discloses method of PRBS selection in modem communication in which a PRBS MEDLEY generator is used in ADSL modems (i.e. *for a sequence of Medley symbols and PRBS can be output to seed generation of a Medley signal*). The ADSL modem selects one of a set of different PRBS generators appropriate to observations made during training or to parameters that may not be known in advance (Column 3 lines 17-25). Carlson further discloses that ADSL modems operate by making extensive measurements on their operating environment during an elaborate training procedure executed when a pair of modems establishes connection. Depending on those measurements, the modem selects a PRBS generator, from a list of PRBS generators stored in memory, that is the most appropriate to the situation determined by the measurements (i.e. *according to at least one transmit signal parameter and generating a pseudo-random bit sequence based on the selected parameter data*) (Figure 2 steps 201 and 203; Column 4 line 56 - Column 5 line 7).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the applicant's invention was made to incorporate the teachings of Carlson into Antoine in order to allow ADSL modems to choose a PRBS generator based on measurements and observations of their operating environment.

17. **Regarding claim 15**, Antoine in view of Carlson discloses that *said selected parameter data comprises at least one of a selected initial state or a selected polynomial*. Specifically, Carlson discloses that a PRBS generator is selected based on

the determined state of the modem (Figure 2 step 203; Column 4 line 56 - Column 5 line 7) or based on the number of carriers (Figure 6 steps 601, 603, 605, and 607; Column 5 line 65 – Column 6 line 12). Furthermore, Carlson discloses the use of PRBS generator which is based on a primitive polynomial (Column 5 lines 59-62) and the selection of a PRBS sequence based on the specification of one of 2^N-1 possible non-zero initial states for a given PRBS generator (Column 3 lines 28-33).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the applicant's invention was made to incorporate the teachings of Carlson into Antoine in order to allow ADSL modems to choose a PRBS generator based on measurements and observations of their operating environment or based on a determined number of carriers.

18. **Regarding claim 16**, Antoine in view of Carlson discloses *transmitting the selected parameter data to a receiver*. Specifically, Carlson discloses that the remote modem is informed of the selection of the PRBS generator (Figure 2 label 205, Figure 6 label 609) regardless of whether the operating environment or the number of carriers determines the specific PRBS generator that is used.

Therefore, it would have been obvious to one of ordinary skill in the art at the time the applicant's invention was made to incorporate the teachings of Carlson into Antoine in order to allow ADSL modems to choose a PRBS generator based on measurements and observations of their operating environment or based on a determined number of carriers.

Allowable Subject Matter

19. Claims 19-29 are objected to as containing minor informalities, but would be allowable if rewritten according to the suggestion in section 3.

20. Claims 4 and 5 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to OTIS L. THOMPSON, JR whose telephone number is (571)270-1953. The examiner can normally be reached on Monday to Thursday 7:30 am to 5:00 pm EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Chirag Shah can be reached on (571)272-3144. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Art Unit: 2619

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Otis L Thompson, Jr./
Examiner, Art Unit 2619

June 6, 2008

/Chirag G Shah/
Supervisory Patent Examiner, Art Unit 2619